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Setosynnema yunnanense sp. nov. from submerged decaying leaves

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Abstract — *Setosynnema yunnanense,* a new species isolated from decaying leaves collected in Xishuangbanna, Yunnan Province, China, is described. It is placed in *Setosynnema* based on its chain-like conidia constricted at some septa (resulting in adjacent cells being connected by a narrow isthmus). It differs from the type species, *S. isthmosporum,* by its deeper and more frequent constrictions and its shorter conidia.

Key Words — tubercularіaceous fungus, systematic, aquatic fungi

Introduction

Setosynnema D.E. Shaw & B. Sutton was erected to accommodate a single anamorphic fungal species, *S. isthmosporum* D.E. Shaw & B. Sutton from Papua New Guinea and Australia, characterized by scattered brown synnematous conidiomata with whorls of setae near the apex (Shaw & Sutton 1985). The conidia are holoblastic, filiform, widest at the centre, and with an isthmus at the central septum tapered towards each end. No additional species have been described. Subsequently, Nawawi (1985) isolated this species from Malaysia, Matsushima (1996) from Japan, and Marvanová & Hywel-Jones (2000) from Thailand. According to K. Seifert (pers. comm.), *Synnematophora* K.R. Sridhar & Kaver. (represented by a single species, *S. constricta* K.R. Sridhar & Kaver. from India; Sridhar & Kaveriappa 2002) is a synonym of *Setosynnema*.

China has an enormous diversity of mycota occurring on dead branches and rotten submerged wood and leaves, and many anamorphic fungi collected

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in southern China have recently been published (Ma et al. 2010, 2011a,b, 2012a,b; Ren et al. 2011, 2012; Zhang et al. 2009a,b, 2011, 2012). During our survey of fungi growing on rotten submerged leaves, we isolated an unknown *Setosynnema* species, which we describe and illustrate here as a new species. We also isolated *S. isthmosporum* from Yunnan Province, a new record for China.

Materials & methods

The culture was isolated from dicotyledonous leaves submerged in a river in Yunnan. A 2–4 × 4–5 cm rotten leaf was spread on the surface of CMA (20 g cornmeal, 18 g agar, 40 mg streptomycin, 30 mg ampicillin, 1000 ml distilled water) for ten days; single conidia were isolated using a sterilized toothpick while viewing with a CX31 microscope and cultivated on CMA in Petri plates. Morphological observations were made from CMA after incubation at 28°C for one week; pure cultures and a permanent slide were deposited in the Herbarium of the Laboratory for Conservation and Utilization of Bio-resources, Yunnan University, Kunming, Yunnan, P.R. China (YMF, formerly Key Laboratory of Industrial Microbiology and Fermentation Technology of Yunnan).

Taxonomy

Setosynnema yunnanense Y.L. Bai & Z.F. Yu, **sp. nov.** Plate 1

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Differs from *Setosynnema isthmosporum* by its shorter conidia that have fewer septa and more than one septum constricted to form an intercellular isthmus.

Type: PR China, Yunnan Province, Xishuangbanna city, Tropical Botanical Garden, Chinese Academy of Science, 21°55′N 101°16′E, elev. 567 m, in a river on submerged leaves of an unidentified dicotyledonous plant, July 2012, Y.L. Bai (**Holotype** YMF1.03964 [dried agar culture]; permanent slide, YMF1.039641; ex-type cultures, YMF1.039642).

Etymology: *yunnanense* refers to the province in which the species was found.

Colonies effuse, brown to dark brown, attaining 35 mm diam. after 7 days on CMA at 28°C. Mycelium partly superficial, partly immersed in substratum, composed of branched, septate, tuberculate hyphae. Vegetative hyphae 2.5–3.5 µm wide, pale brown to brown. Conidiomata are usually massive, stout, synnematous, solitary or in aggregates of 1–3, brown, made up of parallel closely packed brown hyphae, with an expanded spore producing head. Setae absent in pure culture but present on natural substrate. Conidiophores arising close to one another, and flock together closely, septate, smooth, subhyaline to pale brown towards base, hyaline towards apex, sometimes 1–3 irregularly branched, with primary, secondary and tertiary branches, 77–160 µm tall, 3.0–5.0 µm wide, apex somewhat truncate to rounded, invariably with two scars marking position of branches or conidiogenous cells attachment. Conidiogenous cells terminal, apices somewhat rounded or truncate, with two slightly protuberant scars, clavate to cylindrical, hyaline, integrated. Conidia produced in a whitish mass emerging from apex of synnemata, hyaline, sometimes becoming pale

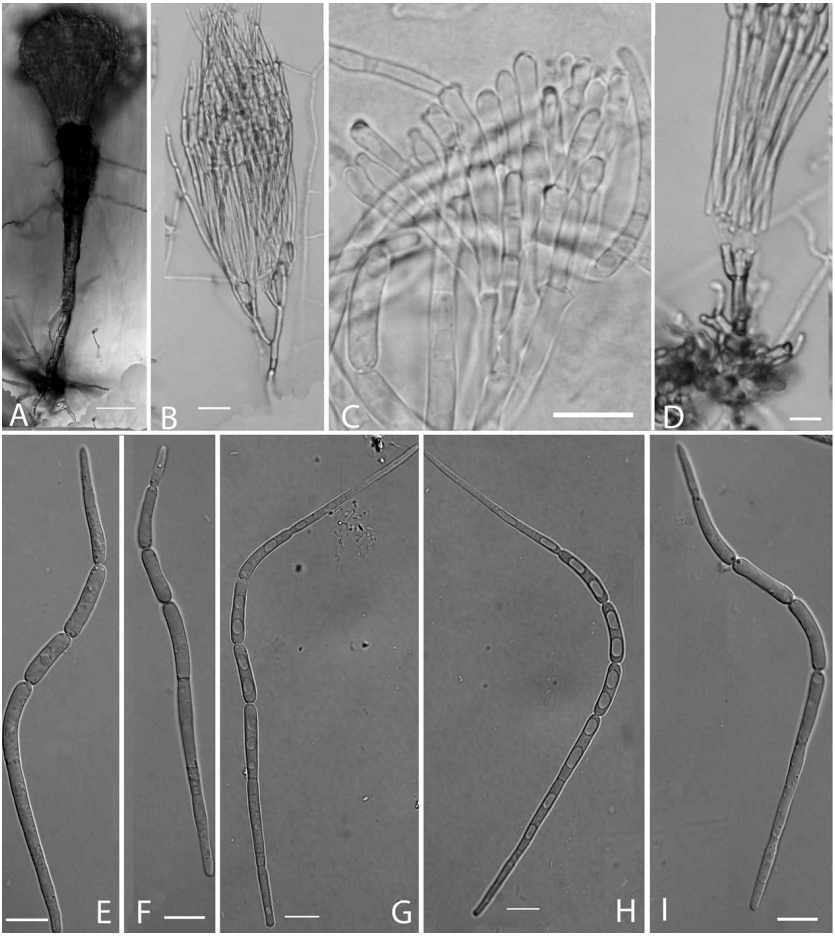

Plate 1. *Setosynnema yunnanense* (holotype YMF1.03964, from pure culture). A. Conidiomata. B. Branched conidiophores bearing conidia in clusters. C. Conidiogenous cells. D. Deciduous conidia and conidiogenous cells. E–I. Conidia. Scale bars: A = 50 μm; B = 20 μm; C–I = 10 μm.

whitish brown, acrogenous, filiform, curved, 94–154 μm long, 2.0–3.0 μm wide at the widest part near the centre, tapering to 1.0–1.5 μm at each end, but distal end often narrower. Uniseriate chains of 6–8 cells, with 2–4 (mainly 3) of the septa between the middle cells constricted to form a narrow isthmus. The number and position of the constricted septa within the conidium is variable; there are 3(–4) constricted septa near the middle of each conidium, with 0–2 unconstricted septa at the distal end and 2 unconstricted septa at the proximal end.

Discussion

Setosynnema yunnanense fits well within *Setosynnema* based on its synnematous conidiomata and filiform septate conidia with strong constrictions at some septa that result in the central cells being connected by narrow isthmi.

However, the conidia of *S. yunnanense* differ from those of *S. isthmosporum,* which has longer conidia ((189–)200.5–260(–290) µm) that are 7–8-septate with only one septum constricted to an isthmus and with similarly wide proximal and distal portions.

We did not see any setae in the pure culture of *S. yunnanense* as noted for *S. isthmosporum*, although we did observe setae on the decaying leaves from which the type species was isolated. In *S. isthmosporum*, setae were rarely produced in pure culture (Shaw & Sutton 1985: 30). This variability in setal production supports the proposed synonymy of *Setosynnema* and *Synnematophora*, for which the presence/absence of setae was proposed as a major differentiating character (Marvanová 2011:876).

The conidiogenous cell apices vary in different strains of the type species. The type strain produces 1–3 applanate, denticulate, unthickened condiogenous loci (Shaw & Sutton 1985). In the Japanese strain, the denticles are not as obvious and are only slightly visible even under the SEM (Matsushima 1996), while two conidiogenous loci are easily observed in the strain from Malaysia (Nawawi 1985). The conidiogenous cell apices of *S. yunnanense* are similar in shape to those of the type strain of *S. isthmosporum*.

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Literature cited

Ma J, Wang Y, O'Neill NR, Zhang XG. 2011a. A revision of the genus *Lomaantha*, with the description of a new species. Mycologia 103(2): 407–410. http://dx.doi.org/10.3852/10-176

Ma J, Zhang YD, Ma LG, Ren SC, Castañeda-Ruíz RF, Zhang XG. 2012a. Three new species of *Solicorynespora* from Hainan, China. Mycol. Progress 11: 639–645. http://dx.doi.org/10.1007/s11557-011-0775-9

Ma LG, Ma J, Zhang YD, Zhang XG. 2010. A new species of *Spadicoides* from Yunnan, China. Mycotaxon 113: 255–258. http://dx.doi.org/10.5248/113.255

Ma LG, Ma J, Zhang YD, Zhang XG. 2011b. Taxonomic studies of *Endophragmiella* from southern China. Mycotaxon 117: 279–285. http://dx.doi.org/10.5248/117.279

Ma LG, Ma J, Zhang YD, Zhang XG. 2012b. A new species of *Corynesporella* and two first records from China. Mycotaxon 119: 83–88. http://dx.doi.org/10.5248/119.83

Matsushima T. 1996. Matsushima Mycological Memoirs. No. 9. Kobe, Japan.

Marvanová L. 2011. Aquatic hyphomycete genera. 874–884, in: K Seifert et al. The genera of hyphomycetes. CBS Biodiversity Series 9.

Marvanová L, Hywel-Jones NL. 2000. *Sigmoidea contorta* sp. nov. and two rare hyphomycete species from streams in Thailand. Cryptogamie Mycologie, 21: 13–26.

Nawawi A. 1985. Some interesting hyphomycetes from water. Mycotaxon 24:217–227.

Ren SC, Ma J, Zhang XG. 2011. A new species and new records of *Endophragmiella* from China. Mycotaxon 117: 123–130. http://dx.doi.org/10.5248/117.123

Ren SC, Ma J, Ma LG, Zhang YD, Zhang XG. 2012. *Sativumoides* and *Cladosporiopsis*, two new genera of hyphomycetes from China. Mycol. Progress 11: 443–448. http://dx.doi.org/10.1007/s11557-011-0759-9

Shaw DE, Sutton BC. 1985. A new aero-aquatic hyphomycete from Papua New Guinea and Australia. Bot. J. Linn. Soc. 91(1–2): 25–36.

Sridhar KR, Kaveriappa KM. 2002. *Synnematophora*, a new aquatic hyphomycete from the Western Ghat forests, India. Indian Journal of Forestry 25: 89–93.

Zhang K, Ma J, Wang Y, Zhang XG. 2009a. Three new species of *Piricaudiopsis* from southern China. Mycologia 101(3): 417–422. http://dx.doi.org/10.3852/08-147

Zhang K, Ma LG, Zhang XG. 2009b. New species and records of *Shrungabeeja* from southern China. Mycologia 101(4): 573–578. http://dx.doi.org/10.3852/09-006

Zhang YD, Ma J, Wang Y, Ma LG, Castañeda-Ruíz RF, Zhang XG. 2011. New species and record of *Pseudoacrodictys* from southern China. Mycol. Progress 10: 261–265. http://dx.doi.org/10.1007/s11557-010-0696-z

Zhang YD, Ma J, Ma LG, Zhang XG. 2012. Two new species of *Taeniolina* from southern China. Mycol. Progress 11: 71–74. http://dx.doi.org/10.1007/s11557-010-0729-7